

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. APPLN. NO. 09/489,895
ATTORNEY DOCKET NO. A7544

REMARKS

Applicants herein editorially amend the specification. The amendments to the specification do not add any new matter. Entry of the amendments to the specification is respectfully requested.

Applicants herein editorially amend claim 1. The amendment to claim 1 removes a typographical error, and thus does not implicate an estoppel in the application of the doctrine of equivalents. The amendment to claim 1 was not made for reasons of patentability.

Claims 1-8 have been examined on their merits, and are all the claims presently pending in the application.

1. Claims 2 and 3 stand rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1-6 of U.S. Patent No. 6,622,287 to Henkel *et al.* Applicants traverse the rejection of claims 2 and 3 for at least the reasons discussed below.

Claims 1-6 of Henkel *et al.* do not recite, teach or suggest at least an instruction-based core model comprising a refined instruction set derived from captured gate-level energy simulation data, wherein the captured gate-level data simulation data is correlated to an initially defined instruction set, and the complexity of the initially defined instruction set has been increased or decreased on the basis of the presence of data dependencies or correlation between instructions of the initially defined instruction set to form the refined instruction set, as recited in claim 2 of the instant application. Furthermore, claims 1-6 of Henkel *et al.* do not recite, teach or

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suggest at least executing a circuit model by invoking instructions from the refined instruction set, and analyzing the estimated energy requirements of the circuit model that uses the refined instruction set. Claims 1-6 of Henkel *et al.* disclose, *inter alia*, calculating utilization rates for a system having a set of cores, and claims 1-6 of Henkel *et al.* do not recite using a refined instruction set derived from captured gate-level energy simulation data. Therefore, Applicants submit that the Examiner's rejection of claims 2 and 3 has been overcome, and respectfully request that the obviousness-type double patenting rejection of claims 2 and 3 be withdrawn.

2. Claims 1-8 stand rejected under 35 U.S.C. § 112 (2nd para.) as allegedly being indefinite. Applicants and their undersigned representative greatly appreciate the Examiner's extensive efforts in preparing proposed amendments for claims 1-8. However, at this stage of the prosecution, Applicants decline to amend claims 1-8 as suggested by the Examiner and traverse the rejection of claims 1-8 for at least the reasons discussed below.

The invention set forth in the claims must be presumed, in the absence of evidence to the contrary, to be that which Applicants regard as their invention. *In re Moore*, 439 F.2d 1232 (CCPA 1971). The content of the specification is not used as evidence that the scope of the claims is inconsistent with the subject matter which Applicants regard as their invention. Agreement, or lack thereof, between the claims and the specification is properly considered only with respect to 35 U.S.C. § 112 (1st para.); it is irrelevant to compliance with 35 U.S.C. § 112 (2nd para.). *In re Ehrreich*, 590 F.2d 902 (CCPA 1979); MPEP § 2173. Furthermore, § 112 (2nd

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para.) does not prohibit Applicants from changing what they regard as their invention during the pendency of the application. *In re Saunders*, 444 F.2d 599 (CCPA 1971)

The Patent Office alleges that the term “instruction set” teaches away from the actual invention disclosed in Applicants’ application in which there are described lower level models and higher level models and the Patent Office does not detect any of that language in the current claim language. Applicants respectfully disagree.

The Patent Office indicates that pages 36-40 of Applicants’ disclosure support its position that the term “instruction set” teaches away. However, pages 36-40 discuss, *inter alia*, the use of objects that have member functions for the simulation of functions performed by circuit elements. For example, the modeled CCDPP core has three instructions, “reset”, “capture” and “read pixel” and the modeled UART core has four instructions “reset”, “enable”, “disable” and “write”. To the extent that the Patent Office is construing the instruction set to be limited to, for example, assembly language instructions, such is in error. Furthermore, Applicants have not made any statements or filed any affidavits or other papers specifically limiting their invention to high level models as the Patent Office appears to suggest. If the Patent Office believes otherwise, Applicants respectfully request that the Patent Office specifically point out in the next Communication where the allegedly limiting statements and/or arguments can be found.

With respect to independent claims 1, 2, 4, 7 and 8, each independent claim recites a feature (albeit of differing scope for each independent claim) of determining of whether an initially defined instruction set has data dependencies or correlation between instructions, and thence modifying the defined instruction set based on the determination to arrive at a refined

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instruction set. *See, e.g.*, pg. 23, lines 23 to pg. 24, line 4; pg. 24, line 18 to pg. 25, line 22;

Figure 7 of the instant application.

With respect to independent claim 6, Applicants have incorporated the Patent Office's suggestions to overcome the § 112 (2nd para.) rejection.

Thus, based on the foregoing reasons, Applicants submit that the § 112 (2nd para.) rejection of claim 1-8 has been overcome, and respectfully request withdrawal of same.

3. Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kageshima *et al.* (U.S. Patent No. 6,096,089) in view of Catthoor *et al.* (U.S. Patent No. 6,223,274) and in further view of Allen *et al.* (U.S. Patent No. 6,151,568). Applicants traverse the rejection of claims 1 and 2 for at least the reasons set forth below.

The initial burden of establishing that a claimed invention is *prima facie* obvious rests on the USPTO. *In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). To make its *prima facie* case of obviousness, the USPTO must satisfy three requirements:

- a) The prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the artisan to modify a reference or to combine references. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988).
- b) The proposed modification of the prior art must have had a reasonable expectation of success, as determined from the vantage point of the artisan at the time the invention was made. *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1209 (Fed. Cir. 1991).

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c) The prior art reference or combination of references must teach or suggest all the limitations of the claims. *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991); *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970).

The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, the nature of a problem to be solved. *In re Dembiczaik*, 175 F.3d 994, 999 (Fed. Cir. 1999). Alternatively, the motivation may be implicit from the prior art as a whole, rather than expressly stated. *Id.* Regardless of whether the USPTO relies on an express or an implicit showing of motivation, the USPTO is obligated to provide particular findings related to its conclusion, and those findings must be clear and particular. *Id.* A broad conclusionary statement, standing alone without support, is not “evidence.” *Id.*; see also, *In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001).

In addition, a rejection cannot be predicated on the mere identification of individual components of claimed limitations. *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000). Rather, particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *Id.*

The Patent Office acknowledges that the combination of Kageshima and Catthoor *et al.* does not expressly disclose at least the determination of data dependencies or correlation between instructions of an initially defined instruction set and decreasing the complexity of the initially defined instruction set based on that determination. *See* para. 2.3, March 25, 2004 Non-

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Final Office Action. The Patent Office alleges that Allen *et al.* provides the necessary disclosure to overcome the acknowledged deficiencies of the combination.

The combination of Kageshima, Catthoor *et al.* and Allen *et al.* does not teach or suggest a determination of whether an initially defined instruction set has data dependencies or correlation between instructions, and thence modifying the defined instruction set based on the determination, as recited in claims 1 and 2. Kageshima discloses gate-level simulations, but it fails to disclose that the simulated instruction set is refined based upon data dependencies or correlation between instructions, as recited in claims 1 and 2. See col. 1, line 53 to col. 2, line 8 of Kageshima. Catthoor *et al.* disclose, *inter alia*, a parallel processing system that uses a flexible mix of hardware and software processors. See, e.g., col. 3, lines 49-53 of Catthoor *et al.* Allen *et al.* disclose, *inter alia*, that if the power consumption estimation is not satisfactory, changes to the architectural description or other parameters can be implemented and the power consumption estimation re-executed. See, e.g., col. 4, lines 35-42; col. 4, line 62 to col. 5, line 3 of Allen *et al.* A more detailed review of the Patent Office's citations to Allen *et al.*, however, do not reveal any further teaching or suggestion of refinement of an initial instruction set based on data dependencies or correlation between instructions of the initially defined instruction set.¹

¹ To the extent that the Patent Office is making an inherency argument with respect to the alleged disclosure of Allen *et al.*, Applicants remind the Patent Office of the Federal Circuit's views with respect to inherency. "That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown. Such a retrospective view of inherency is not a substitute for some teaching or suggestion supporting an obviousness rejection." *In re Rijckaert*, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993) (*citation omitted*). "To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be ... (footnote continued)

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None of the references, either alone or in combination, discloses the refinement of an initially defined instruction set based on the presence of data dependencies or correlation between instructions, as recited in claims 1 and 2. Thus, Applicants submit that the Patent Office cannot fulfill the “all limitations” prong of a *prima facie* case of obviousness, as required by *In re Vaeck*.

Applicants submit that one of ordinary skill in the art would not be motivated to combine the references. *In re Dembiczak* and *In re Zurko* require the Patent Office to provide particularized facts on the record as to why one of skill would be motivated to combine the references. Without a motivation to combine, a rejection based on a *prima facie* case of obviousness is improper. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998)). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999). The Patent Office must make specific factual findings with respect to the motivation to combine references. *In re Lee*, 277 F.3d 1338, 1342-44 (Fed. Cir. 2002). Although the Patent Office provides a motivation analysis with respect to the development of SOCs with Allen *et al.*'s power estimation refining technique, all the references lack any teaching about the desirability of refining of an initially defined instruction set based on the presence of data dependencies or correlation between instructions of

established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999); MPEP § 2112. In the portions of Allen *et al.* cited by the Patent Office, Applicants submit that the mere recitation of “other parameters” does not, without more, inherently disclose the determination of data dependencies or correlations between instructions of an initially defined instruction set for subsequent use in reducing or enlarging the instruction set.

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the initially defined instruction set. Thus, Applicants submit that the Patent Office cannot fulfill the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembicza*k and *In re Zurko*.

Based on the foregoing reasons, Applicants submit that the combination of Kageshima, Catthoor *et al.* and Allen *et al.* fails to disclose all of the claimed elements as arranged in claims 1 and 2. Therefore, the combination of Kageshima, Catthoor *et al.* and Allen *et al.* clearly cannot render the present invention obvious as recited in claims 1 and 2. Thus, Applicants submit that claims 1 and 2 are allowable, and respectfully request that the Patent Office withdraw the § 103(a) rejection of claims 1 and 2.

4. Claim 3 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kageshima *et al.* in view of Catthoor *et al.* and in further view of Allen *et al.* and Dean *et al.* (U.S. Patent No. 6,397,170). Applicants traverse the rejection of claim 3 for at least the reasons set forth below.

The Patent Office acknowledges that the combination of Kageshima, Catthoor *et al.* and Dean *et al.* does not expressly disclose at least the determination of data dependencies or correlation between instructions of an initially defined instruction set and decreasing the complexity of the initially defined instruction set based on that determination. *See* para. 2.4, March 25, 2004 Non-Final Office Action. The Patent Office alleges that Allen *et al.* provides the necessary disclosure to overcome the acknowledged deficiencies of the combination.

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The combination of Kageshima, Catthoor *et al.*, Dean *et al.* and Allen *et al.* does not teach or suggest a determination of whether an initially defined instruction set has data dependencies or correlation between instructions, and thence modifying the defined instruction set based on the determination, as recited in claim 2 and included in claim 3 via dependency. None of the references, either alone or in combination, discloses the refinement of an initially defined instruction set based on the presence of data dependencies or correlation between instructions, as recited in claim 2 and included in claim 3. The deficiencies of Kageshima, Catthoor *et al.* and Allen *et al.* have been discussed above with respect to claim 1, and that discussion is hereby incorporated by reference. Dean *et al.* disclose, *inter alia*, using weighted net toggle information, but there is no teaching or suggestion of modifying an initially defined instruction set based on a determination of data dependency or instruction correlation. Thus, Applicants submit that the Patent Office cannot fulfill the “all limitations” prong of a *prima facie* case of obviousness for claim 3, as required by *In re Vaeck*.

Since neither Kageshima, Catthoor *et al.*, Dean *et al.* nor Allen *et al.* disclose the refinement of an initially defined instruction set based on the presence of data dependencies or correlation between instructions, Applicants submit that one of ordinary skill in the art would not be motivated to combine the references. Although the Patent Office provides a motivation analysis with respect to measuring power consumption with toggle counts, Kageshima, Catthoor *et al.*, Dean *et al.* and Allen *et al.* lack any teaching about the desirability of refining an initially defined instruction set based on the presence of data dependencies or correlation between instructions of the initially defined instruction set. Thus, Applicants submit that the

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Patent Office cannot fulfill the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembicza*k and *In re Zurko*.

Based on the foregoing reasons, Applicants submit that the combination of Kageshima, Catthoor *et al.* and Dean *et al.* fails to disclose all of the claimed elements as arranged in claim 3. Therefore, the combination of Kageshima, Catthoor *et al.* and Dean *et al.* clearly cannot render the present invention obvious as recited in claim 3. Thus, Applicants submit that claim 3 is allowable, and respectfully request that the Patent Office withdraw the § 103(a) rejection of claim 3.

5. Claims 4 and 5 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kageshima *et al.* in view of Catthoor *et al.*, Allen *et al.* and Dean *et al.* Applicants traverse the rejection of claims 4 and 5 for at least the reasons set forth below.

The Patent Office acknowledges that Kageshima does not expressly disclose refining a model with interpolated energy consumption values derived from an earlier complex simulation. However, claim 4 of the instant application does not recite using interpolated energy consumption values. Moreover, the Patent Office acknowledges that the combination of Kageshima, Catthoor *et al.* and Dean *et al.* does not expressly disclose at least the determination of data dependencies or correlation between instructions of an initially defined instruction set and decreasing the complexity of the initially defined instruction set based on that determination. See para. 2.4, March 25, 2004 Non-Final Office Action. The Patent Office alleges that Allen *et*

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al. provides the necessary disclosure to overcome the acknowledged deficiencies of the combination.

The combination of Kageshima, Catthoor *et al.*, Allen *et al.* and Dean *et al.* does not teach or suggest a determination of whether an initially defined instruction set has data dependencies or correlation between instructions, and thence modifying the defined instruction set based on the determination. None of the references, either alone or in combination, discloses the refinement of an initially defined instruction set based on the presence of data dependencies or correlation between instructions of the initially defined instruction set. The deficiencies of Kageshima, Catthoor *et al.* and Allen *et al.* have been discussed above with respect to claim 1, and that discussion is hereby incorporated by reference. As discussed above with respect to claim 3, Dean *et al.* disclose using weighted net toggle information, but there is no teaching or suggestion of modifying an initially defined instruction set based on a determination of data dependency or instruction correlation. Thus, Applicants submit that the Patent Office cannot fulfill the “all limitations” prong of a *prima facie* case of obviousness for claim 4, as required by *In re Vaeck*.

Since neither Kageshima, Catthoor *et al.*, Allen *et al.* nor Dean *et al.* disclose the refinement of an initially defined instruction set based on the presence of data dependencies or correlation between instructions, Applicants submit that one of ordinary skill in the art would not be motivated to combine the references. Although the Patent Office provides a motivation analysis with respect to circuit development with Allen *et al.*’s power consumption refinement technique, Kageshima, Catthoor *et al.*, Dean *et al.* and Allen *et al.* lack any teaching about the

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desirability of refining of an initially defined instruction set based on the presence of data dependencies or correlation between instructions of the initially defined instruction set. Thus, Applicants submit that the Patent Office cannot fulfill the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembicza*k and *In re Zurko*.

Based on the foregoing reasons, Applicants submit that the combination of Kageshima, Catthoor *et al.*, Dean *et al.* and Allen *et al.* fails to disclose all of the claimed elements as arranged in claim 4. Therefore, the combination of Kageshima, Catthoor *et al.*, Dean *et al.* and Allen *et al.* clearly cannot render the present invention obvious as recited in claim 4. Thus, Applicants respectfully submit that claim 4 is allowable, and further submit that claim 5 is allowable as well, at least by virtue of its dependency from claim 4. Applicants respectfully request that the Patent Office withdraw the § 103(a) rejection of claims 4 and 5.

6. Claims 6, 7 and 8 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Loucks *et al.* (U.S. Patent No. 5,828,576) in view of Catthoor *et al.* Applicants traverse the rejection of claim 6 for at least the reasons set forth below.

With respect to claim 6, the combination of Loucks *et al.* and Catthoor *et al.* fails to teach or suggest at least executable code portions for adding idle energy to an energy accumulation count, for calculating consumed power and for adding an energy value to an energy accumulation count. None of the portions of Loucks *et al.* and Catthoor *et al.*, cited by the Patent Office, teach or suggest the above-listed recitations of claim 6. For example, the Patent Office's citation from Loucks *et al.* discusses the placement and operation of monitoring modules.

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Catthoor *et al.* disclose, *inter alia*, a parallel processing system that uses a flexible mix of hardware and software processors. *See, e.g.*, col. 3, lines 49-53 of Catthoor *et al.* The Patent Office has not shown how the combination of Loucks *et al.* and Catthoor *et al.* allegedly teaches or suggests at least executable code portions for adding idle energy to an energy accumulation count, for calculating consumed power and for adding an energy value to an energy accumulation count. Thus, Applicants submit that the Patent Office cannot fulfill the “all limitations” prong of a *prima facie* case of obviousness for claim 6, as required by *In re Vaeck*.

Since neither Loucks *et al.* nor Catthoor *et al.* teaches or suggests at least executable code portions for adding idle energy to an energy accumulation count, for calculating consumed power and for adding an energy value to an energy accumulation count, Applicants submit that one of ordinary skill in the art would not be motivated to combine the references. Both Loucks *et al.* and Catthoor *et al.* lack any teaching about the desirability of executable code portions for adding idle energy to an energy accumulation count, for calculating consumed power and for adding an energy value to an energy accumulation count. Thus, Applicants submit that the Patent Office cannot fulfill the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczaak* and *In re Zurko*.

Based on the foregoing reasons, Applicants submit that the combination of Loucks *et al.* and Catthoor *et al.* fails to disclose all of the claimed elements as arranged in claim 6. Therefore, the combination of Loucks *et al.* and Catthoor *et al.* clearly cannot render the present invention obvious as recited in claim 6. Thus, Applicants respectfully submit that claim 6 is allowable, and respectfully request that the Patent Office withdraw the § 103(a) rejection of claim 6.

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With respect to claims 7 and 8, Applicants do not understand why these claims continue to be rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the combination of Loucks *et al.* and Catthoor *et al.*, since the Patent Office indicated that the rejection of claims 7 and 8 over the combination of Loucks *et al.* and Catthoor *et al.* was withdrawn. *See* para. 2.5, March 25, 2004 Non-Final Office Action. Furthermore, the combination of Loucks *et al.* and Catthoor *et al.* does not teach or suggest a determination of whether an initially defined instruction set has data dependencies or correlation between instructions, and thence modifying the defined instruction set based on the determination. None of the references, either alone or in combination, discloses the refinement of an initially defined instruction set based on the presence of data dependencies or correlation between instructions of the initially defined instruction set. Loucks *et al.* disclose a power monitoring apparatus for high voltage electric power that uses an object-oriented architecture. As discussed above, Catthoor *et al.* disclose, *inter alia*, a parallel processing system that uses a flexible mix of hardware and software processors. Thus, Applicants submit that the Patent Office cannot fulfill the “all limitations” prong of a *prima facie* case of obviousness for claims 7 and 8, as required by *In re Vaeck*.

Since neither Loucks *et al.* nor Catthoor *et al.* disclose the refinement of an initially defined instruction set based on the presence of data dependencies or correlation between instructions, Applicants submit that one of ordinary skill in the art would not be motivated to combine the references. Both Loucks *et al.* and Catthoor *et al.* lack any teaching about the desirability of refining of an initially defined instruction set based on the presence of data dependencies or correlation between instructions of the initially defined instruction set. Thus,

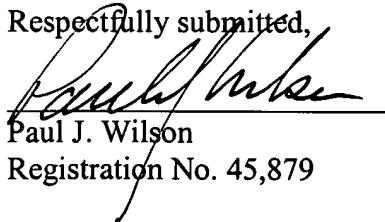
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Applicants submit that the Patent Office cannot fulfill the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczak* and *In re Zurko*.

Based on the foregoing reasons, Applicants submit that the combination of Loucks *et al.* and Catthoor *et al.* fails to disclose all of the claimed elements as arranged in claims 7 and 8. Therefore, the combination of Loucks *et al.* and Catthoor *et al.* clearly cannot render the present invention obvious as recited in claims 7 and 8. Thus, Applicants respectfully submit that claims 7 and 8 are allowable, and respectfully request that the Patent Office withdraw the § 103(a) rejection of claims 7 and 8.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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